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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Re: Appeal to the Board of Patent Appeals and Interferences

In re PATENT application of
Lee et al.

Group Art Unit: 2618

Application No. 10/612,954

Examiner: HAROON, Adeel

Filed: July 7, 2003

Docket : 95-535

Title: OPTIMAL INITIAL GAIN SELECTION FOR WIRELESS RECEIVER

Date: January 3, 2007

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

1   ☐ **NOTICE OF APPEAL**: Applicant hereby appeals to the Board of Patent Appeals and Interferences
    from the decision (not Advisory Action) dated March 21, 2006
    of the Examiner twice/finally rejecting claims

2   ☐ **BRIEF** on appeal in this application attached.

3   ☐ An **ORAL HEARING** is respectfully requested under Rule 194 (due two months after Examiner's Answer
    unextendable).

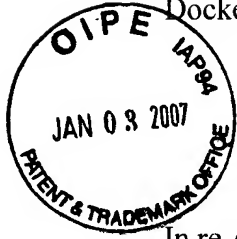4   ☒ Reply Brief is attached (due two months after Examiner's Answer – unextendable).

5. FEE CALCULATION:		Large/Small Entity	
If box 1 above is X'd, see box 12 below first and decide: . . . . enter		$500/250*	$
If box 2 above is X'd, see box 12 below first and decide: . . . . enter		$500/250*	$
If box 3 above is X'd, see box 12 below first and decide: . . . . enter		$1000/500*	$
If box 4 above is X'd, ... enter nothing		- 0 - (no fee)	
6. **Original** due date: January 3, 2007			
7. **Petition is hereby made** to extend the original due date to cover the date this response is filed for which the requisite fee is attached	(1 mo) $120 (2mos) $450 (3mos) $1020 (4mos) $1590	+ $0	
8. Enter any previous extension fee paid [ ] previously since above original due date (item 6); [ ] with concurrently filed amendment		-	
9. **Subtract line8 from line7 and enter: Total Extension Fee**		+$0	
10.	**TOTAL FEE ATTACHED =**	$ 0	

11. ☐ *Fee **NOT** required if/since paid in prior appeal in which the Board of Patent Appeals and Interferences
     did not render a decision on the merits.

Atty:_____

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of   :

LEE *et al.*   :

Serial No.: 10/612,954   :   Group Art Unit: 2618

Filed: July 7, 2003   :   Examiner: HAROON, Adeel

For: OPTIMAL INITIAL GAIN SELECTION FOR WIRELESS RECEIVER

MAIL STOP: <u>APPEAL BRIEF – PATENTS</u>
Commissioner for Patents
P.O. Box 1450
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<div align="center"><u>REPLY BRIEF</u></div>

Sir:

In response to the Examiner's Answer mailed November 2, 2006, Appellant submits this Reply Brief in accordance with 37 C.F.R. §41.41.[1]

<u>Introduction</u>

The Examiner's Answer fails to rebut Appellant's arguments that independent claims 1 and 4 are not anticipated under 35 U.S.C. §102(b) in view of Kopmeiners et al. In particular, the suggested interpretation in the Examiner's Answer <u>disregards explicit claim limitations,</u> is <u>inconsistent with the specification,</u> and is inconsistent with the interpretation <u>those skilled in the art would reach,</u> and therefore legally improper.

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[1] Since the two-month deadline of January 2, 2007 was deemed a "Federal holiday within the District of Columbia" (in view of this day proclaimed by President Bush as a National Day of Mourning), filing of the Reply Brief on January 3, 2007 is timely under 37 CFR §1.7.

In fact, Kopmeiners et al. does not even disclose the features according to the suggested interpretation in the Examiner's Answer. For these and other reasons, the §102 rejection of independent claims 1 and 4 must be reversed.

Examiner's Failure to Rebut Appellant's Argument A1

The Examiner's Answer fails to rebut <u>any</u> of Appellant's arguments with respect to requiring the claims to be interpreted in a manner that (1) considers <u>each</u> of the explicit claim limitations, and that (2) is *consistent* with the specification. Rather, the Examiner's Answer simply provides suggested interpretations without presenting any justification or any rational basis to support the suggested interpretations; hence, the Examiner's Answer not only demonstrates an improper interpretation of the claims *in a vacuum*, with no regard for the specification, as required,[2] but demonstrates a disregard for <u>explicit claim limitations</u> that renders the rejection legally deficient.[3]

For example, the Examiner's Answer states on pages 6-7 (sec. A1):

> [t]he word "relative" does not necessitate the optimum gain value be determined solely from a single power value as the appellant argues. The word "relative" only requires that the optimum gain is determined with reference to the initial gain value and the first power value ....

Appellant <u>never</u> argued that the term "relative" itself necessitated that the optimum value be determined "solely" from a single power value. Rather, Appellant argued that the <u>explicit claim language</u> required any apparatus to be <u>capable of</u> determining the optimum gain value from a *single power value* (See Amended Appeal Brief at pages 6-8).

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[2]It is well settled that "claims are not to be read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their 'broadest <u>reasonable</u> interpretation.'" *In re Marosi*, 710 F.2d 799, 802, 218 USPQ 289, 292 (Fed. Cir. 1983)(emphasis in original)).

[3]"All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)."

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Specifically, the claims explicitly specify **all possible states of the first power value**, namely [1] "if *the first power value* of the received wireless signal *does not* exceed the prescribed input range," and [2] "if *the first power value* of the received wireless signal *exceeds the prescribed input range*" (the Examiner apparently refuses to recognize that it is logically impossible for the first power value to have any state other than one of these two specified states). Further, the claims specify, for each possible state for the claimed "first power value", the specific manner in how the optimum gain is to be determined for the received wireless signal:

> if the first power value of the received wireless signal *does not exceed the prescribed input range*, determining an optimum gain for the received wireless signal relative to the initial gain value and the first power value;
> if the first power value of the received wireless signal *exceeds the prescribed input range*, determining the optimum gain for the received wireless signal based on setting the gain to a minimum gain value

Hence, the claims explicitly specify the manner for determining the optimum gain based explicitly on whether the first power value (1) does not exceed the prescribed input range, or (2) does exceed the prescribed input range.

Further, the recital of "**the** first power **value**" in singular form (with antecedent basis recital of "the" incorporating the limitations of the prior recitals of "the first power value") required any apparatus to be capable of determining the optimum gain value from a single power value:

> the recital of "the first power value" in singular form (as opposed to the plural "values") requires that the optimum gain must be able to be determined from a single power value, namely the first power value generated by amplifying the received wireless signal by the initial gain value.

(Amended Brief at page 7, para. 2)

Hence, recital of the singular form of "the first power value" does require an apparatus to be capable of determining the optimum gain from a **single** power value.

Further, the claims explicitly specify (via antecedent basis) that "*the* first power value" is generated based on: (1) "setting a gain to an initial gain value *for mapping a received wireless*

signal to a first power value"; and (2) and "amplifying the received wireless signal *by the initial gain value to the first power value.*" Hence, it is improper to focus on a *single word* ("relative"), and disregard the remaining explicit claim limitations as described above.

Further, the specification describes with respect to step 204 of Fig. 3 that if saturation is not detected, then "determining the optimum gain" is not performed by further changes in amplification of the received wireless signal, **but by computing in step 208 the optimum gain based on the first power level created by amplifying the received wireless signal** *at the existing initial gain (G=G$_{INIT}$)* (page 8, lines 1-3).

Hence, *if* the first power value does not exceed the prescribed input range, then the claimed "determining an optimum gain ... *relative to* the *initial* gain value and the *first* power value" cannot be so broadly construed as to encompass additional changes to the gain in amplifying the received wireless signal. Rather, the broadest reasonable interpretation, as specified in the explicit claim language and consistent with the specification[4], must be interpreted such that if the first power value does not exceed the prescribed input range, then the optimum gain is determined relative to the initial gain value *and* the first power value (i.e., the power *level* of the received wireless signal having been amplified *at the existing initial gain*).

Moreover, the Examiner Answer has failed to present any rational basis for any alternative interpretation of the explicit claim language, as described above, that also is consistent with the specification. Rather, the proposed interpretation by the Examiner Answer requires an improper disregard of the explicit claim language.

Examiner's Failure to Rebut Appellant's Argument A2

With respect to the assertion on page 7 of the Examiner Answer that the features relied upon are not claimed, the Examiner Answer has failed to acknowledge that this issue was already

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[4]It is well settled that "claims are not to be read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their 'broadest reasonable interpretation.'" *In re Marosi*, 710 F.2d 799, 802, 218 USPQ 289, 292 (Fed. Cir. 1983)(emphasis in original)).

addressed in section A1 *supra* and section A1 of the Amended Appeal Brief (see pages 7-8), where it was demonstrated that any *reasonable* interpretation cannot be inconsistent with the specification): in fact, the Examiner Answer fails to provide any rational alternative interpretation that is *consistent* with the specification.

The Examiner Answer not only fails to rebut Appellant's Argument A2 by evading Appellant's <u>factual arguments regarding the disclosure of Kopmeiners et al.</u>, but the Examiner Answer *also* fails to demonstrate that Kopmeiners et al. discloses "that the optimum gain is determined *with reference to* the initial gain value and the first power value", as asserted at the top of page 7 of the Examiner Answer. Hence, the Examiner Answer has failed to satisfy its burden of demonstrating that the applied reference discloses each of the claimed elements <u>as arranged in the claims under review</u>. *In re Bond*, 15 USPQ2d 1566, 1567 (Fed. Cir. 1990) (citing *Lindemann Maschinenfabrik GmbH*).[5]

The Examiner Answer *admits* on page 6 that "Kopmeiners et al.'s system makes course adjustment *after* the initial gain value has been applied and *after* the first power value has been checked to be in the dynamic range" (page 6, A1).

Further, there is no disclosure or suggestion in Kopmeiners et al. that the optimum gain is determined "with reference to" the initial gain value and the first power value", as asserted in the Examiner Answer. In fact, col. 5, lines 19-24 (relied upon by the Examiner Answer) specifies that *even if* a peak is within the dynamic range of the ADC 120 (and therefore does not exceed the prescribed input range), the gain is *still adjusted* in <u>additional increments</u>. In fact, Kopmeiners et al. discloses that any "optimum gain" is determined "with reference to" whether the *peak signal level is within the operating range of the ADC 120*:

The first stage of the algorithm is a search mode in which the gain of VGA 110 is

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[5] "Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, <u>arranged as in the claim</u>." *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984). "Anticipation cannot be predicated on teachings in the reference which are vague or based on conjecture." *Studiengesellschaft Kohle mbH v. Dart Industries, Inc.*, 549 F. Supp. 716, 216 USPQ 381 (D. Del. 1982), *aff'd.*, 726 F.2d 724, 220 USPQ 841 (Fed. Cir. 1984).

varied rapidly in order to bring the strength of the amplified signal within the dynamic range of ADC 120. During the search phase, peak detector 132 reads the peak signal level during an initial, relatively short time interval using a peak-hold function (Step 205). The sampled peak signal is then read by analyzer 134, which determines whether the peak signal is within the dynamic range of ADC 120 (Step 210). If too much gain is applied, ADC 120 will be driven to its upper limit (saturation). *If insufficient gain is supplied, ADC 120 will be at its lower limit (i.e., zero signal energy output)*. If the peak signal is · within the dynamic range of ADC 120 (i.e., some output value between the upper and lower limits), AGC 130 makes a coarse adjustment of the gain control signal of VGA 110 in order to set the output of VGA 110 to approximately the target peak level (Steps 220 et seq.). This coarse adjustment will be explained below in greater detail.

If the sampled peak signal level initially read by peak detector 132 is *not within the dynamic range* of ADC 120, AGC 130 adjusts the gain control signal of VGA 110 according to an established search algorithm (Step 215). The process of sampling the signal peak level using a peak-hold function, determining if it is within the dynamic range of ADC 120, and adjusting gain according to the search algorithm if it is not, *is repeated until the peak signal level is within the operating range of ADC 120 (i.e., loop through Steps 205, 210 and 215)*.

(Col. 5, lines 8-35)

As noted by the Examiner on pages 2-3 of the Final Action, in Kopmeiners et al. "the parts of the gain control technique are conducted in a *loop fashion*" (see para. 2) and has an "iterative nature" where "the process is looped back".   As shown in Figures 2A, 2B, and 3, Kopmeiners et al. repeatedly adjusts the gain at steps 215, 230, and 260 during search, coarse adjust, and fine adjust stages, with repeated iterations to locate an optimum gain.

Moreover, the "search algorithms" in the above quote of Col. 5, lines 8-35 are described by Kopmeiners et al. as either a bisection search (col. 5, lines 36-63) requiring several iterations of gain adjustment (col. 5, lines 58-63), that are continued until the signal peak level is within the operating range of the ADC 120:

Other search algorithms are also known, including the search algorithm depicted in FIG. 3. FIG. 3 depicts a search algorithm which *moves through the dynamic range* of the analog-to-digital converter *in incremental* (or decremental) *steps* equal to the dynamic range of the receiver, in this instance, 20 dB. *The search mode ends when the received signal comes within the dynamic range of ADC 120*. When peak detector 132 and

analyzer 134 determine that a signal peak has been received that is within the range of ADC 120, analyzer 134 compares the sampled signal peak level with an optimum target peak level. The target peak level may be predetermined by control signals received from control circuitry (not shown) coupled to AGC 130.

(Col. 5, line 64 to col. 6, line 7).

Hence, Kopmeiners et al. discloses that the "search mode" (i.e., successively changing the gain) ends only after the "signal peak" is within the range of ADC 120; after the search mode is complete, however, gain still is adjusted until the **average** of "the signal peak level" is "very close to" the "target peak level" (see col. 6, lines 46-54). Using the interpretation suggested in the Examiner Answer, the "optimum gain" is determined "with reference to" the **average of the sampled signal peak level.**

Hence, Kopmeiners et al. consistently discloses that the "optimum gain" is determined "with reference to" whether the **average of the sampled signal peal level** is "very close to the target peak level". As described above, the Examiner Answer has failed to establish any rational alternate interpretation that would demonstrate that Kopmeiners et al.s discloses each and every element in the manner claimed, and any assertions by the Examiner Answer to the contrary are insufficient to overcome the deficiencies in the applied reference. "A prior art patent is a reference only for that which it teaches." *Corning Glass v. Sumitomo Electric*, 9 USPQ2d 1962, 1970 (Fed. Cir. 1989).

Hence, the §102 rejection should be withdrawn because it fails to demonstrate that the applied reference discloses each and every element of the claim. As specified in MPEP §2131: "'A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference' *Verdegaal Bros. V. Union Oil Co. of California,* 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). ... 'The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.,* 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)." MPEP 2131 (Rev. 3, Aug. 2005, at p. 2100-76).

<u>Examiner's Failure to Rebut Appellant's Argument A3</u>

The Examiner Answer demonstrates an unreasonable interpretation of the claimed feature of "if the first power value of the received wireless signal exceeds the prescribed input range, *determining the optimum gain* for the received wireless signal based on *setting the gain to a minimum gain value*".

Moreover, the Examiner Answer fails to rebut Appellant's argument that the *broadest reasonable interpretation* must be consistent with the specification, which illustrates with respect to Figs. 2 and 3 that the gain calculator 116 determines the optimum gain in step 208 by the gain selector 114 setting in step 206 the gain to a minimum ($G=G_{MIN}$), and the amplifier 110 outputting the new amplified signal (P_1) (having been amplified at the new gain ($G=G_{MIN}$)) to the gain calculator 116 (page 7, lines 27-33).

Hence, the Examiner Answer has failed to rebut Appellant's argument that the broadest reasonable interpretation of "determining the optimum gain" must be consistent with the disclosed **computing the optimum gain based on the power level created by amplifying the received wireless signal *at the existing gain*** (i.e., setting the gain to a minimum gain value), <u>without</u> further changes in amplification of the received wireless signal.

Further, the Examiner Answer fails to rebut Appellant's argument that broadest reasonable interpretation of "minimum gain value" cannot be inconsistent with the specification, which specifies that the gain is set to a <u>minimum</u> level ($G=G_{MIN}$) in order to initiate optimum gain calculations for a signal determined (based on the first power value exceeding the prescribed input range causing "saturation") to have a <u>high input level</u>, in order to enable the gain to be obtained within two steps (e.g., page 7, lines 10-20 and 28-33).

In fact, the proposed interpretation of "minimum" applied by the Examiner Answer is <u>inconsistent with the specification</u>: the Examiner Answer is disregarding the requirement that "claims are interpreted *in light of the specification*", which disclosed in steps 206 and 208 **computing the optimum gain based on the power level created by amplifying the received wireless signal *at the minimum gain ($G=G_{MIN}$)*,** <u>without</u> further changes in amplification of the received wireless signal.

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Examiner's Failure to Rebut Appellant's Argument A4

As noted above, the Examiner Answer fails to rebut Appellant's argument that the Examiner is relying on an unreasonable interpretation of the claimed "determining the optimum gain for the received wireless signal based on setting the gain to a minimum gain value". The Examiner Answer has failed to establish any <u>rational basis</u> to establish that the claimed "minimum gain value" should be so broadly construed as to encompass the disclosed <u>decrementing</u> of gain by 20dB in Kopmeiners et al.

Kopmeiners et al. provides no disclosure or suggestion of the broadest reasonable interpretation of "determining the optimum gain for the received wireless signal based on setting the gain to a minimum gain value", consistent with the disclosed **computing the optimum gain based on the power level created by amplifying the received wireless signal** *at the existing gain* (i.e., setting the gain to a minimum gain value), <u>without</u> further changes in amplification of the received wireless signal. Any assertions by the Examiner to the contrary are insufficient to overcome the deficiencies in the applied reference. "A prior art patent is a reference only for that which it teaches." *Corning Glass v. Sumitomo Electric*, 9 USPQ2d 1962, 1970 (Fed. Cir. 1989).
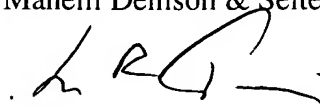
Hence, the rejection should be withdrawn because it fails to demonstrate that the applied reference discloses <u>each and every element of the claim</u>. It is not sufficient that a single prior art reference discloses each element that is claimed, but the reference <u>also</u> must disclose that the elements <u>are arranged as in the claims under review</u>. *In re Bond*, 15 USPQ2d 1566, 1567 (Fed. Cir. 1990) (citing *Lindemann Maschinenfabrik GmbH*).

Conclusion

For the reasons set forth above, it is clear that Appellant's independent claims 1 and 4 are patentable over the reference applied. Accordingly the appealed claims 1-7 should be deemed patentable over the applied reference. It is respectfully requested that the Examiner's rejections be reversed.

Respectfully submitted,

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Date: January 3, 2007
(January 2, 2007 = Federal Holiday)

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